

Crosslinked Polymer

Abstract

A method is provided for obtaining crosslinked polymers, particularly
5 fluorinated polymers having pendent sulfonic acid groups, by crosslinking through
pendent groups which include a sulfonyl chloride group ($-\text{SO}_2\text{Cl}$). The sulfonyl
chloride group may be removed by application of electromagnetic radiation, typically in
the ultraviolet band, or a radical initiator, leaving behind a radical which readily binds
covalently to other polymer strands or to crosslinking agents to form crosslinks.
10 Typically, the polymer is made by providing a polymer comprising pendent groups
which include a group according to the formula $-\text{SO}_2\text{F}$ and converting at least a portion
of the $-\text{SO}_2\text{F}$ groups to $-\text{SO}_2\text{Cl}$. After crosslinking, the remaining $-\text{SO}_2\text{F}$ groups may
be converted to sulfonic acid groups, yielding a crosslinked polymer electrolyte. Such
crosslinked polymer electrolytes may be used to make polymer electrolyte membranes
15 (PEM's) that may be used in electrolytic cells such as fuel cells.